



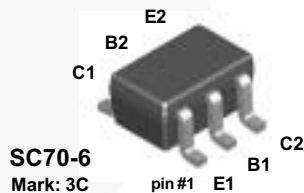
August 2015

# BC857S

## PNP, Multi-Chip, General-Purpose Amplifier

### Description

This device is designed for general-purpose amplifier applications at collector currents to 200 mA. Sourced from Process 68.



SC70-6  
Mark: 3C

NOTE: The pinouts are symmetrical; pin 1 and pin 4 are interchangeable. Units inside the carrier can be of either orientation and will not affect the functionality of the device.

Figure 1. Device Package

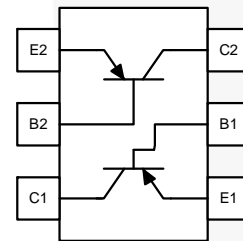


Figure 2. Internal Connections

### Ordering Information

Part Number	Top Mark	Package	Packing Method
BC857S	3C	SC70 6L	Tape and Reel

### Absolute Maximum Ratings<sup>(1),(2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	-45	V
$V_{CES}$	Collector-Base Voltage	-50	V
$V_{CBO}$	Collector-Base Voltage	-50	V
$V_{EBO}$	Emitter-Base Voltage	-5.0	V
$I_C$	Collector Current - Continuous	-200	mA
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

#### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty cycle operations.

### Thermal Characteristics<sup>(3)</sup>

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Max.	Unit
$P_D$	Total Device Dissipation	300	mW
	Derate Above $25^\circ\text{C}$	2.4	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	415	$^\circ\text{C/W}$

**Note:**

3. PCB size: FR-4 76 x 114 x 1.57 mm<sup>3</sup> (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

### Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = -10\text{ mA}$ , $I_B = 0$	-45			V
$V_{(BR)CES}$	Collector-Base Breakdown Voltage	$I_C = -10\ \mu\text{A}$ , $I_E = 0$	-50			V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = -10\ \mu\text{A}$ , $I_E = 0$	-50			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = -10\ \mu\text{A}$ , $I_C = 0$	-5			V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -30\text{ V}$			-15	nA
		$V_{CB} = -30\text{ V}$ , $T_A = 150\ ^\circ\text{C}$			-4	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ V}$	125		630	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{ mA}$ , $I_B = -0.5\text{ mA}$			-0.30	V
		$I_C = -100\text{ mA}$ , $I_B = -5.0\text{ mA}$			-0.65	
$V_{BE(on)}$	Base-Emitter On Voltage	$I_C = -2.0\text{ mA}$ , $V_{CE} = -5.0\text{ V}$	-0.60		-0.75	V
		$I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ V}$			-0.82	
$f_T$	Current Gain-Bandwidth Product	$I_C = -10\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ , $f = 100\text{ MHz}$		200		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -10\text{ V}$ , $f = 1.0\text{ MHz}$		3.5		pF
NF	Noise Figure	$I_C = -0.2\text{ mA}$ , $V_{CE} = -5.0\text{ V}$ , $R_S = 2.0\text{ k}\Omega$ , $f = 1.0\text{ kHz}$ , $BW = 200\text{ Hz}$		2.5		dB

### Typical Performance Characteristics

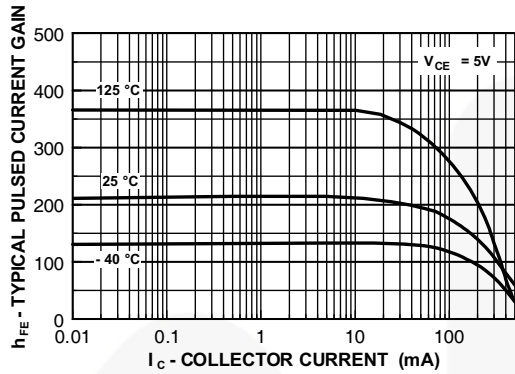


Figure 3. Typical Pulsed Current Gain vs. Collector Current

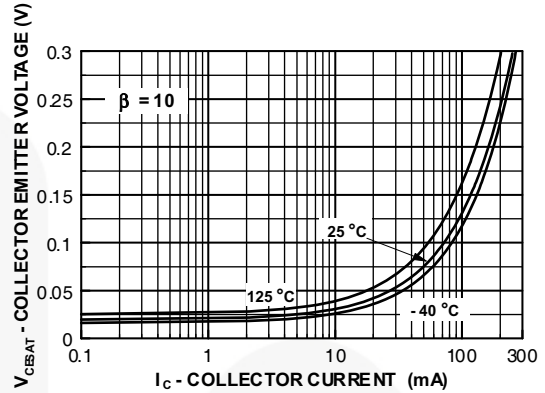


Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

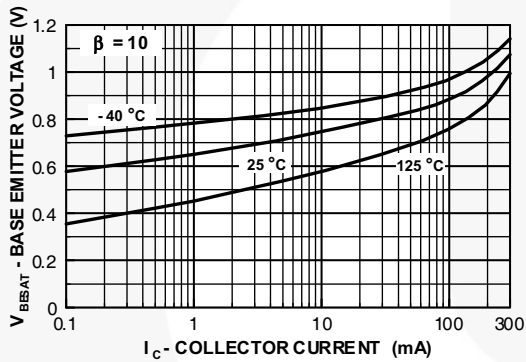


Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

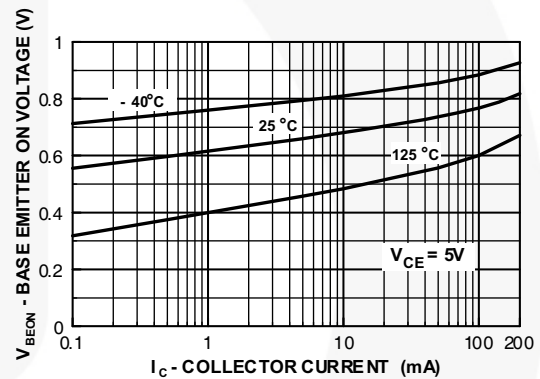


Figure 6. Base-Emitter On Voltage vs. Collector Current

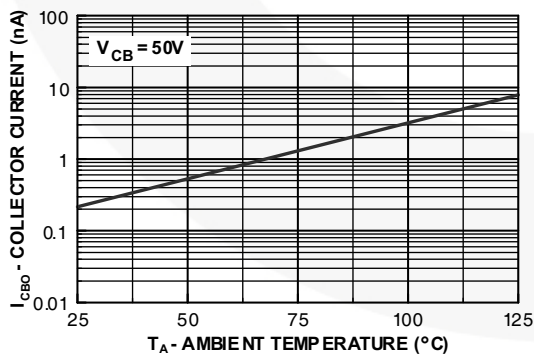


Figure 7. Collector Cut-Off Current vs. Ambient Temperature

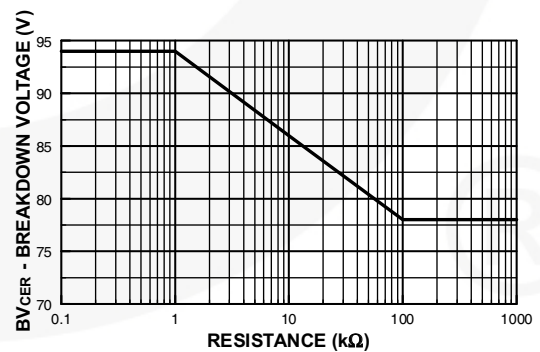
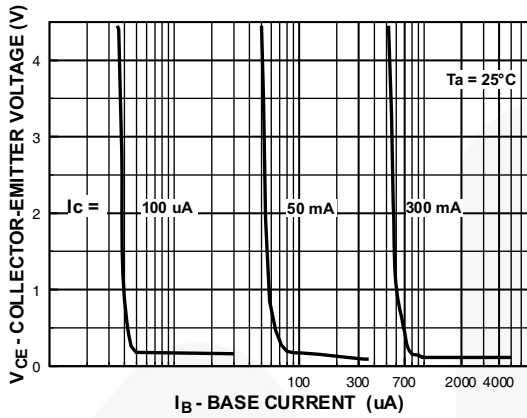
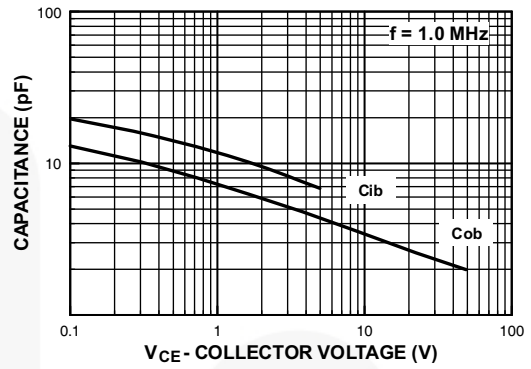


Figure 8. Collector-Emitter Breakdown Voltage with Resistance between Emitter-Base

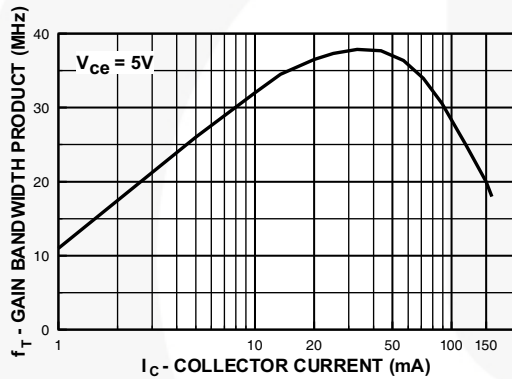
**Typical Performance Characteristics** (Continued)



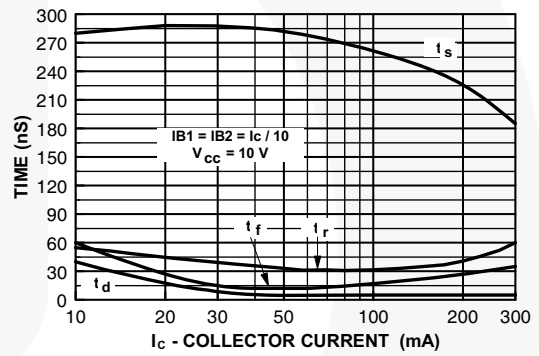
**Figure 9. Collector Saturation Region**



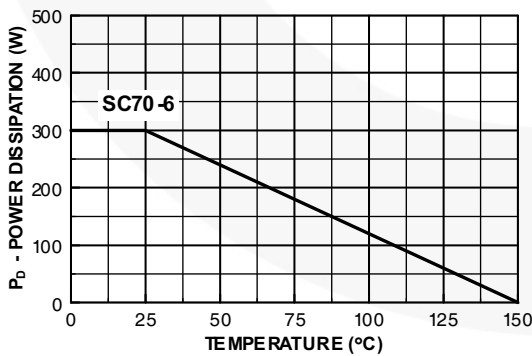
**Figure 10. Input and Output Capacitance vs. Reverse Voltage**



**Figure 11. Gain Bandwidth Product vs. Collector Current**



**Figure 12. Switching Times vs. Collector Current**



**Figure 13. Power Dissipation vs. Ambient Temperature**

Physical Dimensions

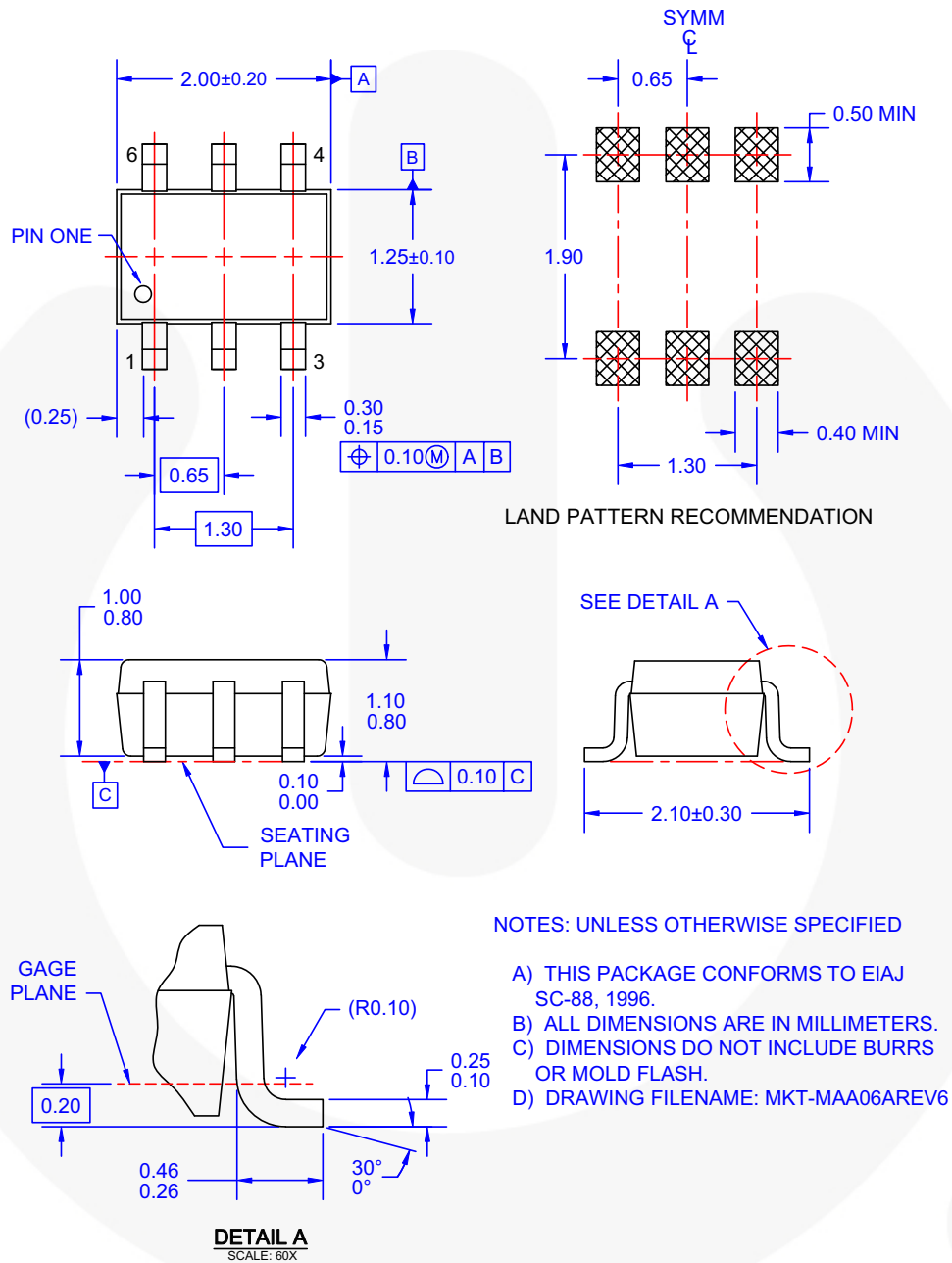


Figure 14. 6-LEAD, SC70, EIAJ SC-88, 1.25 MM WIDE



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